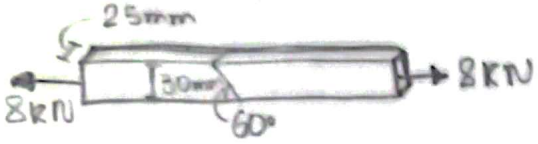
MEC. SOL. I

ATIVIDADE 3

01)



$\nearrow_+ \Sigma F_x = 0 \therefore N - P \cdot \text{tran}\theta = 0 \therefore N = 8 \cdot \text{tra}$

$\uparrow \Sigma F_y = 0 \therefore V - P\cos\theta = 0 \therefore V = 8\cos 60$

$$A = \frac{h \cdot b}{\text{tran}\theta} \therefore \sigma = \frac{N}{\frac{h \cdot b}{\text{tran}\theta}} \therefore \sigma = \frac{6,928}{\left(\frac{0,025 \cdot 0,03}{\text{tran}60}\right)} \therefore \boxed{\sigma = 7999,77}$$

$$\tau = \frac{V}{A} = \boxed{4618,8\,kN = 4,62MPa}$$

02) $\nearrow_+ \Sigma F_x = 0 \therefore V - P\cos\theta = 0 \therefore \boxed{V = 425\cos(15°) = 410,518N}$

$\uparrow \Sigma F_y = 0 \therefore N - P\,\text{tran}\theta = 0 \therefore \boxed{N = 425\,\text{tran}(15) = 1N}$

$$A = \frac{0,025 \cdot 0,075}{\text{tran}(15)} = 0,00724 \quad \sigma = \frac{N}{A} = \underline{0,0152MPa} \quad \tau = \frac{V}{A} = \underline{0,0}$$

$$\sigma_{AB} = \frac{N_{AB}}{A_{AB}} = \underline{2,4MPa} \qquad \sigma_{BC} = \frac{N_{BC}}{A_{BC}} = \underline{0,598MPa}$$

03) $\nearrow_+ \Sigma F_x = 0 \therefore -V + \frac{4\cos 30}{2} = 0 \therefore \boxed{V = 1,732kN}$

$\uparrow \Sigma F_y = 0 \therefore N - \frac{4\,\text{tran}30}{2} = 0 \therefore \boxed{N = 1kN}$

$$A = \frac{(h/2) \cdot b}{\text{tran}\theta} = \frac{\left(\frac{0,05}{2}\right) \cdot 0,0375}{\text{tran}30} = 0,01875$$

$$\boxed{\sigma = \frac{N}{A} = 533,33Pa} \qquad \boxed{\tau = \frac{V}{A} = 923,76Pa}$$

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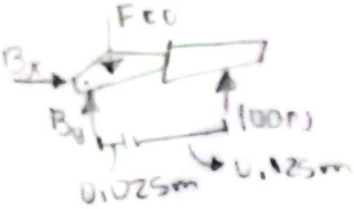
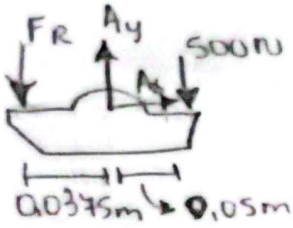
04)

* Parte A (FBD): $\Sigma F_x = 0$ $\boxed{B_x = 0}$



$\Sigma M_D = 0$ $100(0,125) - B_y \cdot (0,025) = 0 \therefore \boxed{B_y}$

* Parte B:



$\Sigma F_x = 0 \therefore \boxed{A_x = 0}$

$\Sigma M_E = 0 \therefore A_y \cdot 0,0375 - B_y (0,0$

$\boxed{A_y = 1166,67N}$

$A_{pino} = \frac{\pi \cdot d^2}{4} = \frac{\pi \cdot 0,125^2}{4} = 0,01227$

$V_A = 0,5(A_y) \therefore \boxed{V_A = 583,33N}$ $\boxed{T = \frac{V_A}{A_{pino}} = 29,709MPa}$

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